

REMARKS

Applicant has studied the Office Action dated February 17, 2005 and has made amendments to the claims. It is submitted that the application, as amended, is in condition for allowance. Claims 1-20 are pending. Claims 1, 2, 6, 8-10, 14, and 16-18 have been amended. Reconsideration and allowance of the pending claims in view of the above amendments and the following remarks are respectfully requested.

Claims 1-20 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-31 of co-pending Application Serial No. 09/850,390. If this later becomes an actual rejection, Applicant will respond in due course. However, Applicant submits that no action is necessary at this time due to the provisional status of the rejection.

Claims 1-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Bracho et al. (U.S. Patent No. 6,021,443) in view of Jacobs et al. (U.S. Patent No. 6,732,237). This rejection is respectfully traversed.¹

The present invention is directed to systems and methods for providing scalable resource discovery in a distributed computer network. One preferred embodiment of the present invention provides a method for discovering resources in a network of user nodes. According to the

¹ Applicant notes that in rejecting claims the Examiner only recited the claim language and then cited paragraphs of the cited references. However, these are no more than conclusory statements of obviousness. To make out a prima facie case of obviousness under 35 U.S.C. § 103(a), the Examiner must show that every limitation of every rejected claim is taught by the cited references. Applicant cannot properly respond to a rejection containing only a conclusory allegation that paragraphs of the cited reference teach each of the limitations of the rejected claims. It is respectfully requested that, when making any rejections, the Examiner specifically explain how the cited reference teaches each limitation of each rejected claim, along with the necessary citation to where such teachings can be found in the cited reference, so that Applicant can fully understand and properly respond to such rejections.

method, a resource request to be published is received at a first user node of the network from one of the user nodes through a direct connection, and it is determined whether to send the resource request to a publish-subscribe server node or to send the resource request to another of the user nodes. When it is determined to send the resource request to another of the user nodes, the resource request is forwarded from the first user node to a second user node of the network. When it is determined to send the resource request to the publish-subscribe server node, the resource request is sent from the first user node to the publish-subscribe server node for publication to a plurality of the user nodes of the network.

Because resource requests are selectively forwarded through other user nodes rather than always being sent directly from the requesting user node to the publish-subscribe server node, requesting user nodes gain privacy. The actual user node that is requesting the resource remains anonymous to the server node, so the server node cannot keep track of which users are sharing (or even requesting) which resources. Further, the sending of the resource request to the publish-subscribe server node for publication via the publish-subscribe messaging infrastructure layer allows for efficient resource discovery in a network having a very large number of user nodes. Thus, scalability is achieved in a decentralized network while enhanced user privacy is provided.

The Bracho reference is directed to a system and method for routing events between publishers and subscribers that are connected together through a network. The Jacobs reference is directed to a system and method for caching data such that a desired level of performance is maintained. However, neither Bracho nor Jacobs, or a combination of the two, discloses a method for discovering resources in which a resource request to be published is received at a first user node of the network from one of the user nodes through a direct connection, it is determined whether to send the resource request to a publish-subscribe server node or to send the resource request to another of the user nodes, and the resource request is forwarded from the first user node to a second user node of the network when it is determined to send the resource request to another of the user nodes, as is recited in amended claim 1. Amended claim 9 contains similar recitations.

Similarly, neither Bracho nor Jacobs, or a combination of the two, discloses a user node that includes a receiving interface for receiving a resource request to be published from one of the user nodes through a direct connection, control means for deciding whether to send the resource request to the publish-subscribe server node or to send the resource request to another of the user nodes, and at least one transmitting interface that forwards the resource request to a second user node when the control means decides to send the resource request to another of the user nodes, as is recited in amended claim 17.

Bracho discloses a system and method for using hubs that are connected to a network to route events between publishers and subscribers. As shown in Figure 1, publishers 102, 110, and 166 and subscribers 104, 112, and 118 are connected to a network 120 through hubs 106, 108, and 114. Each publisher publishes events and each subscriber subscribes to receive events of certain types based on content. More specifically, each publisher and each subscriber is connected so as to be a client of one of the hubs, and the hubs are interconnected through the network. A publishers sends, via publication through the hubs, an advertisement to all subscribers to let the subscribers know the types of events that are published by that publisher. Based on the advertisements received, a subscriber sends one or more subscriptions to its local hub to subscriber to one or more types of events. A publisher publishes all its events by sending each event to its local hub. That hub sends the event to all local subscribers that have subscribed to events of that type, and also forwards the event to the other hubs so that each can send the event to all its local subscribers that have subscribed to events of that type.

Thus, in the publish-subscribe messaging system of Bracho, the interconnected hubs together form a "server cloud" that operates as the publish-subscribe server. See specification at 7:22-8:2. Each publisher and each subscriber is a "user node" operated by a user (i.e., publisher user node or subscriber user node), and each of the user nodes is connected as a client of the publish-subscribe server (i.e., through a connection with one of the hubs of the server cloud). See Bracho at 5:35-38. The subscriber user nodes request certain types of events (i.e., data structures or other information) by sending subscriptions directly to the publish-subscribe server,

and in response the publish-subscribe server sends the requested events, as they are published, to the appropriate subscriber user nodes.

In contrast, in preferred embodiments of the present invention, a user node receives a resource request (that is to be published) from another user node through a direct connection. In embodiments of the present invention, a "resource request" is a request for a resource, such as a request for access to a file or other information stored on the network or a request for use of network hardware. In the system of Bracho, neither the publisher user nodes nor the subscriber user nodes receive, from another user node through a direct connection, any "resource requests" that request resources. The publisher user nodes only send information to the publish-subscribe server, and the subscriber user nodes only receive events and advertisements (i.e., event types available for subscription) from the publish-subscribe server. Because no information is transmitted through direct connections between user nodes, Bracho cannot possibly teach or suggest a system in which a "resource request" is received at one user node from another user node through a direct connection.

Additionally, in the system of Bracho, the only requests of any type that are transmitted are subscription requests that request that certain types of events be sent to the subscriber user node. However, subscription requests are only sent from the subscriber user nodes to the publish-subscribe server, and subscription requests are never received by any user node from another user node through a direct connection. Bracho does not teach or suggest a system in which a resource request is received at a user node from another user node through a direct connection.

Further, in preferred embodiments of the present invention, it is determined whether to send a resource request to a publish-subscribe server node or to another user node. When it is determined to send the resource request to another user node, the resource request is forwarded from the user node to another user node of the network. On the other hand, when it is determined to send the resource request to the publish-subscribe server node, the resource request is sent from the user node to the publish-subscribe server node. In the system of Bracho, it is

never determined whether to send an advertisement, a subscription request, or an event to either the publish-subscribe server node or another user node.

In the system of Bracho, the publish-subscribe server always sends both advertisements and events to the subscriber user nodes. The publisher user nodes always send events to the publish-subscribe server, and the subscriber user nodes always send subscription requests to the publish-subscribe server. Bracho does not teach or suggest a system in which it is determined whether to send a resource request to the publish-subscribe server or to send the resource request to another of the user nodes. Because resource requests are selectively forwarded through other user nodes rather than always being sent directly from the requesting user node to the publish-subscribe server node, requesting user nodes gain privacy.

Jacobs discloses a system and method for caching data in which the consistency of the data is allowed to fluctuate in order to maintain a desired level of performance. More specifically, users 108 are coupled to a network 104 and a content server 106 is also coupled to the network 106 through a cache server 102, as shown in Figure 1. The users 108 submit requests for content to the cache server 102 via the network 104. In response to a content request, the cache server 102 determines if the requested content is present in its cache and marked valid, as shown in Figure 3.

If so, the cache server 102 responds to the content request by sending the content from its cache to the requesting user. If not, the cache server 102 either sends the content request to the content server 106 to obtain a valid version of the requested content or, if necessary to maintain the desired level of performance, sends to the requesting user an invalid version of the requested content from its cache. Thus, in the system of Jacobs, the cache server determines whether to pass a content request on to the content server, or to just return stale content to the requesting user in order to avoid the performance degradation that would occur if the content request was passed on to the content server.

In contrast, in preferred embodiments of the present invention, it is determined whether to send a resource request to the publish-subscribe server node or to another user node. When it is

determined to send the resource request to another user node, the resource request is forwarded from the user node to another user node of the network. On the other hand, when it is determined to send the resource request to the publish-subscribe server node, the resource request is sent from the user node to the publish-subscribe server node. In the system of Jacobs, the cache server never determines whether to send a request to either the publish-subscribe server node or another user node. The cache server only determines whether to send a request on to the content server or to send a response to the request (that contains stale content) back to the requesting user. Jacobs does not teach or suggest a system in which it is determined whether to send the request to the publish-subscribe server node or to send the request to another of the user nodes.

Furthermore, in preferred embodiments of the present invention, a resource request is forwarded from the user node to another user node of the network, when it is determined to send the resource request to another user node. Because a resource request is selectively forwarded through other user nodes rather than always being sent directly to the publish-subscribe server node, the requesting user node gains privacy. In the system of Jacobs, a request is never forwarded from one user to another user. A request is only ever sent from the requesting user to the cache server. Jacobs does not teach or suggest a system in which, when it is determined to send a resource request to another user node, the resource request is forwarded from the user node to another user node of the network.

Applicant believes that the differences between Bracho, Jacobs, and the present invention are clear in amended claims 1, 9, and 17, which set forth various embodiments of the present invention. Therefore, claims 1, 9, and 17 distinguish over the Bracho and Jacobs references, and the rejection of these claims under 35 U.S.C. § 103(a) should be withdrawn.

As discussed above, amended claims 1, 9, and 17 distinguish over the Bracho and Jacobs references, and thus, claims 2-8, claims 10-16, and claims 18-20 (which depend from claims 1, 9, and 17, respectively) also distinguish over the Bracho and Jacobs references. Therefore, it is


respectfully submitted that the rejection of claims 1-20 under 35 U.S.C. § 103(a) should be withdrawn.

Applicant has examined the references cited by the Examiner as pertinent but not relied upon. It is believed that these references neither disclose nor make obvious the invention recited in the present claims. In view of the foregoing, it is respectfully submitted that the application and the claims are in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is invited to call the undersigned attorney at (561) 989-9811 should the Examiner believe a telephone interview would advance the prosecution of the application.

Respectfully submitted,

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